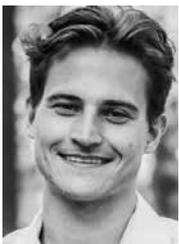


Michał Myck and Kajetan Trzciński  
**From Partial to Full  
 Universality: The Family 500+  
 Programme in Poland and its  
 Labor Supply Implications<sup>1</sup>**



Michał Myck  
 Center for Economic  
 Analysis (CenEA).



Kajetan Trzciński  
 Center for Economic  
 Analysis (CenEA).

## INTRODUCTION

A recent extension of the flagship family support program of the Law and Justice government, the Family 500+, will add an extra cost of about PLN 18.3 billion (EUR 4.3 billion) per year to the already generous initial scheme, which cost PLN 21.9 billion (EUR 5.2 billion) per year and has been in operation since April 2016.<sup>2</sup> The value of the extended program will be equivalent to about 2 percent of Polish GDP. The program, which on introduction supported every second and subsequent child in the family with a sum of PLN 500 (EUR 118) per month and directed the same amount to every first child in low-income families, has become fully universal for all children aged 0–17 as of July 1, 2019.<sup>3</sup> The initial design has substantially reduced absolute and relative child poverty in Poland (from 9.0 to 4.7 percent and 20.6 to 15.3 percent respectively between 2015 and 2017, GUS 2017) and may have played a role in a modest increase in the fertility rate following its implementation. As argued in Myck (2016) and in Magda et al. (2018), this came at a cost of reduced female labor market participation.

The level of financial support for families with children in Poland before 2016 was one of the lowest in the EU, and a higher level of transfers seemed necessary to reduce child poverty. Yet while increased financial benefits to low-income families were clearly called for, the cost of the proposed program and its relative generosity raised questions, on the one hand, of its long-run sustainability and, on the other, of the implications of the scheme for labor market activity among parents, and especially mothers. The program was already operational in April 2016, i.e. less than half a year after the general election that brought the Law and Justice party to power, and it was simultaneously rolled out across the whole country. This substantially limits the potential for ex-post evaluations of its labor market consequences, although several attempts have been

made since data for 2017 became available (see: Magda et al. 2018 and Premik 2019). The only existing ex-ante evaluation (Myck 2016) which was based on 2013 data, suggested that the scheme, as implemented in 2016, would in the long run reduce the labor supply of mothers by over 200,000. In this paper we present an update and an extension of this analysis using data from the latest year prior to the introduction of the Family 500+ program, i.e. 2015, testing the robustness of the results in an alternative specification and simulating both the initial design of the policy and its latest, extended, universal version. We follow the methodological approach of Myck (2016) and apply the approach to modeling labor supply decisions in the form of a discrete choice labor supply model along the lines of van Soest (1995) and Blundell et al. (2000), which has found numerous applications in recent decades and has been verified in a number of reduced form ex-post evaluations (e.g. Eissa and Liebman 1996; Francesconi and van der Klaaw 2007; Francesconi et al. 2009; Geyer et al. 2015).

The paper starts with an outline of the design of the Family 500+ program and a discussion of its generosity and distributional implications. Next we present the data we use for the analysis and some descriptive labor market statistics, as well as a basic outline of the labor supply model. We then present the results of the simulated labor supply effects of the initial and the universal versions of the Family 500+ program. We find that while the simulated response to the partially means-tested program is negative, the universal policy results in a broadly neutral labor supply reaction.

## THE FAMILY 500+ REFORM: DESIGN AND DISTRIBUTIONAL IMPLICATIONS

The introduction of the Family 500+ program in April 2016 marked an unprecedented shift of financial resources towards families with children. The policy benefited 2.7 million families and increased the total value of the financial support for families with kids by about 140 percent (see: Myck et al. 2015, Myck et al. 2016, Brzeziński and Najsztub 2017, Goraus and Inchauste 2016). The policy was implemented alongside the existing instruments of family support, but the government decided to introduce the Family 500+ benefits in a way that did not reduce the eligibility of families to other means-tested transfers, such as Family Benefits or Social Assistance. In its initial format the policy consisted of the following key elements:

- Each family with two or more children aged 0–17 was eligible to (n-1) universal payments of 500 PLN per month, where n is the total number of children in the 0–17 age group in the family;
- Low-income families, those with net income up to PLN 800 per person per month, were additionally eligible to PLN 500 per month for their first (oldest) child in the 0–17 age group (the means test threshold was PLN 1,200 per person per month for families with a disabled child);

<sup>1</sup> The authors are grateful for support from the FROGEE project funded by the Swedish International Development Cooperation Agency, Sida. Data used for the analysis have been provided by the Polish Central Statistical Office (GUS) who bear no responsibility for the results and their interpretation. The paper uses CenEA's microsimulation model SIMPL, which has been developed in a number of collaborative projects since 2005.

<sup>2</sup> Throughout the paper we use the exchange rate from 1 April 2016 of EUR 1 = PLN 4.24.

<sup>3</sup> PLN 500 was equivalent to 37 and 31 percent of monthly net minimum wage of a single person without children respectively in April 2016 and July 2019.

- Eligibility for payments for the first child was assessed with reference to the average monthly post-tax per capita family income from the most recent tax return of the parents or guardians of children, with special rules defining eligibility for farmer families.

The 2019 reform of the program largely boiled down to scrapping of the means test for the benefits targeted at the first child in the family. Additionally, the reform extended the benefits to children in institutional care and introduced several administrative simplifications.

In Figure 1 we present the budget constraints for stylized households in the three tax and benefit systems we model in our analysis: the baseline system of 2015 (“Baseline”), and two systems extended by the 500+ benefit: one with the initial 500+ design with means testing for the first child (“Initial 500+”); the other with fully universal eligibility (“Expanded 500+”). Figure 1 also includes an adjustment for the introduction of the tapered withdrawal of family benefits, a reform implemented in January 2016. As the budget constraints demonstrate, for a single-earner household with one child (case A) under the initial 500+ program the benefit is fully withdrawn when gross monthly family income reaches PLN 3,150 per month. In case C,

where the first earner receives PLN 2,187.50 per month (125 percent of the 2016 minimum wage) and there is one child in the household, the second earner only has to cross a threshold of PLN 940 per month for the family to lose the benefit. In stylized households with three children (cases B and D), the threshold is PLN 5,080 per month for a single earner and PLN 2,860 per month for the second earner in a two-earner household.

In Table 1 we present the distributional consequences of both the initial 500+ program and its recent extension by decile groups as a proportion of the respective total cost. Not only has the total expenditure nearly doubled with the expansion of the program, but – as could be expected – the additional spending is disproportionately allocated to the upper income deciles.

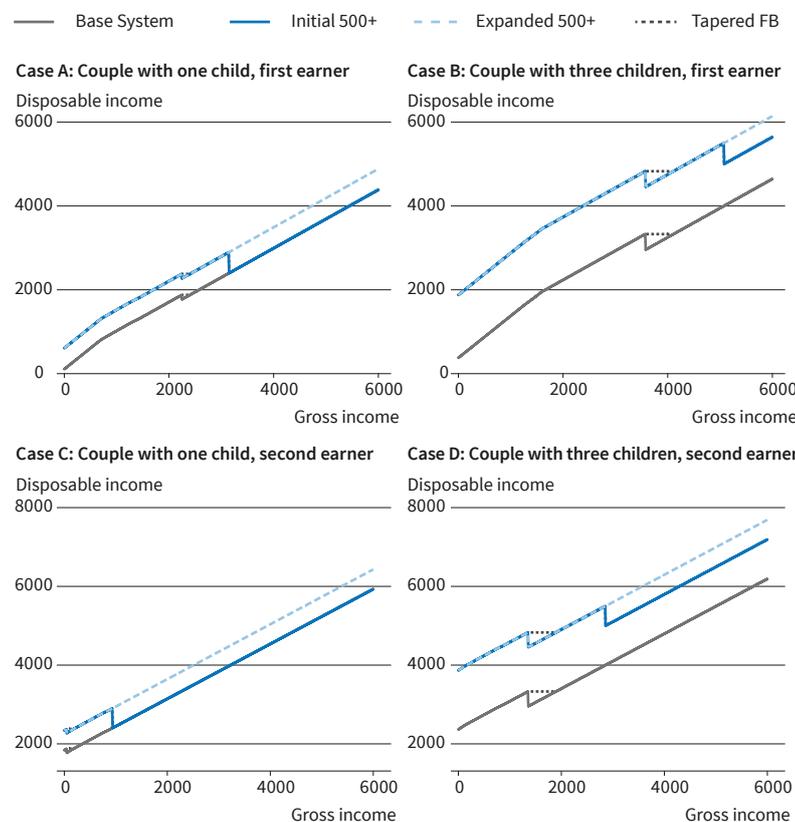
**DATA AND LABOR MARKET DYNAMICS 2011–2017**

The main set of results presented in the paper is based on data from the annual Polish Household Budget Survey (PHBS) for 2015 – the last year prior to the introduction of the 500+ program. These results are compared to simulations using earlier years of data (2013 and 2014), which are presented in the appendix. The

analysis follows the discrete choice labor supply framework (see e.g. Aaberge et al. 1995, van Soest 1995 and Blundell et al. 2000), which has long been a standard method of estimating preferences with regard to leisure and consumption (van Soest et al. 2002, Brewer et al. 2006, Haan and Myck 2007, Callan et al. 2009, Haan and Wrohlich 2011, Bargain et al. 2014, Figari 2015, Mastrogiacomo et al. 2017). Given that the approach relies on the assumption of choice of the optimal labor market state, we limit the samples to families with at least one individual who is defined as labor supply flexible. In our case we limit the sample to individuals aged 18–59/54 (respectively men and women) and exclude individuals who are: students, unemployed, disabled, and retired. We also exclude from the estimation those who are self-employed due to the usual limitations with regard to the precision of estimating their incomes in specific labor market scenarios. For individuals in couples, their decisions are modeled using two approaches:

Figure 1

**Family Budget Constrains: Before and After the Introduction and Expansion of the Family 500+ Programme**



Notes: All income is measured in Polish New Sloty per month. 'Tapered FB' represent the reformed withdrawal of Family Benefits which came into effect on 1st Jan 2016, i.e. prior to introduction of the 500+ Programme. Source: Authors' calculations using the SIMPL microsimulation model. © ifo Institute

Table 1

Cost and Distribution of Initial and Expanded 500+ Program

	Income deciles										Total annual cost (PLN bn)
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	
Initial 500+	10.16%	12.26%	13.04%	12.26%	11.02%	9.70%	7.87%	7.64%	7.59%	8.46%	21.86
Expansion of 500+ in July 2019	1.42%	3.01%	6.34%	7.98%	9.96%	11.92%	13.01%	13.83%	15.42%	17.11%	18.29
Total 500+	6.18%	8.04%	9.96%	10.28%	10.56%	10.73%	10.21%	10.48%	11.16%	12.40%	40.16

Notes: Values presented for deciles represent the proportional allocation relative to the total cost presented in the final column.  
Source: Based on Table 5 in Myck et al. (2019). Calculated using CenEA's SIMPL tax and benefit microsimulation model based on 2017 PHBS data.

one in which both men and women – who are labor supply flexible according to the above conditions – are assumed to adjust to labor market incentives (Model A), and the second in which we assume that labor supply of men does not react to financial incentives (Model B) and is thus kept fixed. Models for singles and for couples with only one flexible partner are estimated separately for men and women.

**Female Labor Market Dynamics in the PHBS Data**

As background to the estimation, we present a brief description of labor market developments over the recent years in Poland using PHBS data for 2011–2017. In Figure 2 we show the dynamics of labor market status of women aged 20–54 split by the number of dependent children in the family. Figure 2a shows the proportion of women who declared working in the month of the interview, while Figures 2b–2d show employment rates, i.e. include women who declared having a job but who were away from it at the time of the survey.

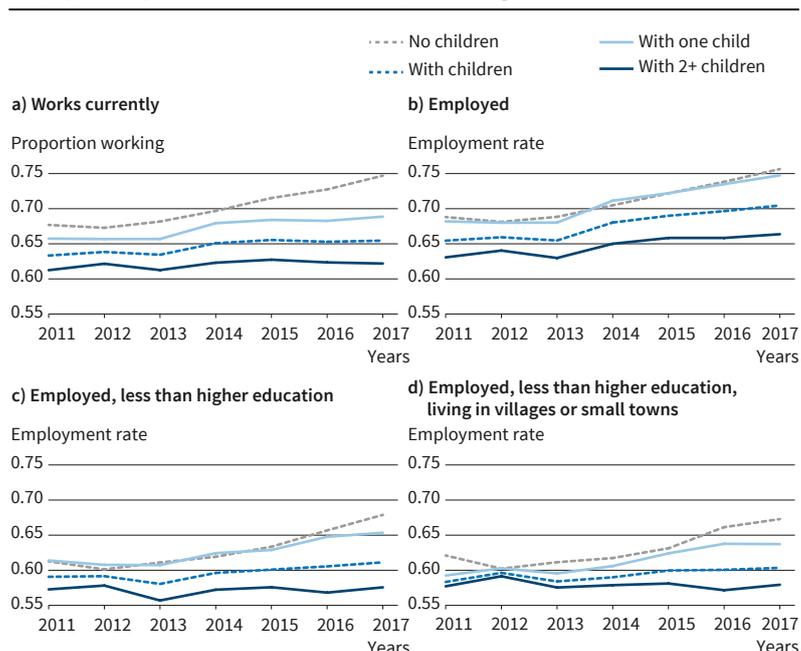
As we can see, there has been a substantial increase in labor market activity among women since about 2012, which has been particularly pronounced among women without children. What's worth noting is also the evident change from about 2013 in the proportion of women with children who are employed but are away from their jobs. This is reflected in the difference between the patterns in Figures 2a and 2b, where we can see a growing divergence in the proportion of women who work between those with and without children (Figure 2a) that is much less noticeable in the level of employment presented in Figure 2b. This

pattern reflects substantial increases in the length and coverage of maternal leave, which grew gradually from 18 weeks in 2009 to 26 in 2013 and was additionally extended by a further 26 weeks of parental leave that can be taken by either parent.

The rapid growth of the economy and the accompanying increases in the demand for labor in Poland, which started in 2015, finds its reflection in the substantial growth in employment among women both with and without children. The employment rate in the sample of childless women aged 20–54, as measured in the PHBS, grows from 70.5 to 75.6 percent between 2014 and 2017 and it is nearly matched by employment dynamics among mothers with one child (growth from 71.1 to 74.8 percent). However, a comparison of the employment rate among women without children to employment dynamics for all mothers and for those with more than one child shows some interesting differences. Employment among all mothers grew only

Figure 2

Employment Dynamics in Poland 2011-2017, Women Aged 20-54



Notes: Women aged 20-54; employment category (2b-2d) includes those currently working and those who have a job but are currently away from it. Women with children limited to those with the youngest child aged <18.  
Source: Authors' calculations based on PHBS data from 2011-2017, using population adjusted grossing-up weights (Myck and Najsztub 2015).

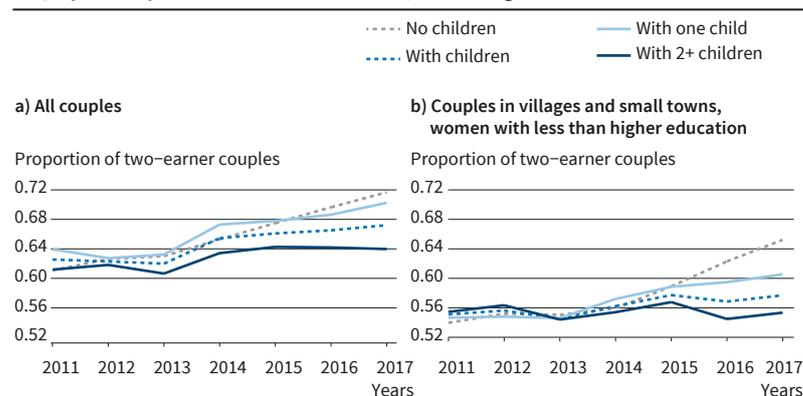
from 68.0 to 70.5 percent, while the employment rate among mothers of two or more children went up from 65.0 to 66.4 percent, despite the dynamic performance of the Polish labor market. While these differences cannot be taken as direct evidence of the effect of the changes in financial incentives to work resulting from the Family 500+ benefits, they seem to reflect a shift in labor market behavior among mothers following the introduction of the reform.<sup>4</sup> Figures 2c and 2d provide further evidence in favor of the negative employment consequences of the introduction of Family 500+.

Figure 2c shows female employment dynamics for women with less than higher education, while in Figure 2d we further narrow the sample and focus on women with less than higher education living in small towns (up to 20,000 inhabitants) and villages. These groups of women are likely to face relatively low earnings, and they may additionally face other constraints in the form of poor access to public childcare and long distances to work. We would therefore expect mothers in these groups to react more strongly to changes in financial incentives such as the 500+ program. The evidence presented in Figures 2c and 2d seems supportive of such developments. Between 2014 and 2017, the employment rate among low-educated women without children went up by nearly 6 percentage points (p.p., from 61.9 to 67.9 percent), while among low-educated mothers of two or more children by only 0.4 p.p. (from 57.2 to 57.6 percent). Among women without higher education who live in villages and small towns (Figure 2d), the divergence in the pattern of employment is even more evident. The employment rate for women without children between 2014 and 2017 grew by 5.6 p.p., among those with one child by 3.1 p.p. and among those with two or more children it stayed essentially flat between 2014 and 2017 at around 58 percent.

Further evidence of labor market consequences of the introduction of the Family 500+ benefit can be drawn from changes in the pattern of employment among partners in couples. It has been well established in the literature that increases in means-tested

Figure 3

### Employment Dynamics in Poland 2011-2017, Women Aged 20-54



Notes: Women aged 20-54, men aged 20-59; employment includes those currently working and those who have a job but are currently away from it. Women with children limited to those with the youngest child aged <18.

Source: Authors' calculations based on PHBS data from 2011-2017, using population adjusted grossing-up weights (Myck and Najsztub 2015).

© ifo Institute

support, in particular in support which increases family out-of-work incomes in single-earner scenarios, tend to reduce the proportion of couples in which both partners are employed (e.g. Blundell et al. 2000, Haan and Myck, 2007). In Figure 3, we show the dynamics of the proportion of two-earner couples in the PHBS data from 2011–2017. The ratios are calculated for couples in which women are aged 20–54 and men are aged 20–59 and an earner is a person who is either working at the time of the survey or has a job and is currently away from it. As in Figure 2, we divide the sample into couples without and with children, and in the latter case split them further for those with one and with two or more children. In Figure 3a we present result for all couples, while in Figure 3b for couples living in villages and small towns in which the woman has less than higher education. The pattern of changes in the dynamics of the proportion of two-earner couples with and without children is once again strongly suggestive of a negative employment effect following the introduction of the Family 500+ reform in 2016. Among all couples (Figure 3a), and in particular among those in which women are likely to face low earnings (Figure 3b), we see a flattening or a drop in the proportion of couples with both partners in work against significant increases in this proportion for couples without children. The change in the dynamics of the pattern of employment in couples is particularly evident in Figure 3b. For couples living in rural areas in which women have less than higher education, the difference in the proportion of two-earner couples between childless couples and those with one child or more than one children in 2015 was 0.1 p.p. and 2.1 p.p. respectively. By 2017 it grew to 4.7 p.p. in the case of couples with one child and to 9.9 p.p. among those with two or more children. Clearly, other developments may have contributed to such a pattern, but the change in the follow up of the introduction of the Family 500+ reform

<sup>4</sup> It needs to be noted that on January 1, 2016 a new mechanism for mothers of newborns was implemented that extended support to those who do not qualify for insurance-based maternal and parental leave benefits. This policy (with benefits of up to PLN 1,000 per month) may also have negatively affected the level of labor market participation among women. However, these benefits cover only mothers of children up to the age of one. We run robustness tests of the labor supply reaction in which we excluded mothers of children below one year old from the analysis. Such sample restrictions limit our estimates of the labor supply reaction to the 500+ program by 7–10 percent.

strongly suggests that it was one of the important drivers of the observed dynamics.

**MODELING LABOR MARKET CHOICES**

The most comprehensive approach to ex-post modeling of the consequences of the Family 500+ reform so far has been presented in Magda et al. (2018), who use the Polish Labor Force Survey data and estimate the effect of the reform by comparing the dynamics of labor market activity among mothers and women without children before and after the introduction of the benefit in April 2016. The estimated effects suggest a drop in labor market participation of around 100,000 women about one year after the introduction of the reform. Due to the nature of this analysis, these results reflect only short-term implications; as a result of sample limitations, they cover only mothers with one or two children. The approach also highlights the difficulty with identification of an appropriate control group for an ex-post estimation in a situation when the treatment is fully rolled out at a single point in time, as was the case with the Family 500+ reform. The advantage of the structural approach presented here is that the change in financial incentives resulting from the reform can be isolated by design from all other developments in the labor market. This facilitates singling out of the labor supply consequences of the simulated changes in the generosity of family support.

Following the approach used in Myck (2014 and 2016), given the level of detail in the PHBS data we base our structural model on three labor supply scenarios: not employed, part-time employed, and full-time employed. For models where we estimate decisions of singles or of couples with only one flexible partner, this implies considering a choice between these three options, while in specifications where we model decisions of both partners, we model the choice from among nine labor supply combinations (three for each of the partners).<sup>5</sup> In the latter case, the most general specification of the deterministic part of the utility function is:

$$U_{ij}(c_{ij}, w_{ij}^m, w_{ij}^f) = \beta_{1i}c_{ij} + \beta_2(c_{ij})^2 + \beta_{3mi}w_{ij}^m + \beta_{3fi}w_{ij}^f + \beta_{4m}pt_{ij}^m + \beta_{4f}pt_{ij}^f + \gamma_{1f}c_{ij}w_{ij}^f + \gamma_{1m}c_{ij}w_{ij}^m + \gamma_{2f}c_{ij}pt_{ij}^f + \gamma_{2m}c_{ij}pt_{ij}^m + \gamma_{3mf}w_{ij}^m w_{ij}^f$$

(1)

where  $c_{ij}$  is consumption of household  $i$  in labor market scenario  $j$ , equivalent in this static context to disposable income in scenario  $j$ ,  $w_{ij}^m$  and  $w_{ij}^f$  are dummy variables for work status – either full- or part-time – of the man and woman respectively, while  $pt_{ij}^m$  and  $pt_{ij}^f$  are dummy variables for part-time work. Naturally, the utility functions assumed for couples with only one flexible partner and for singles are more straightforward, as in these cases we model a decision of only one person. In

<sup>5</sup> In the case of so-called complex households in (Haan and Myck 2012), i.e. households made up of more than one nuclear family, we model only the decisions of the main family in the household and treat the behavior of other household members as exogenous.

the first case – assuming the flexible partner is female – the deterministic part of the utility function takes this form:

$$U_{ij}(c_{ij}, \bar{Y}_i^m, w_{ij}^f) = \beta_{1i}c_{ij} + \beta_2(c_{ij})^2 + \beta_{3fi}w_{ij}^f + \beta_{4f}pt_{ij}^f + \gamma_{1f}c_{ij}w_{ij}^f + \gamma_{2f}c_{ij}pt_{ij}^f$$

(2)

$\bar{Y}_i^m$  represents the income of the man, which is assumed to be fixed across the  $j$  labor market states of the woman. The partner’s income in equation (2) is the only element of the utility function that distinguishes the specification for couples with one flexible partner and singles.

Individuals are assumed to maximize their utility subject to a household-level budget constraint that is a function of wages ( $\omega_i$ ), work status ( $w_{ij}$ ), household characteristics ( $X_i$ ), out of work incomes ( $y_i$ ), and the tax and benefit function ( $\varphi$ ). The latter translates gross incomes into disposable incomes, which in this static setup are assumed to be equivalent to the level of consumption. Thus, in the case where we model the decisions of partners in couples, the budget constraint function takes the following form:

$$c_{ij} = \phi[\omega_i^m, \omega_i^f, w_{ij}^m, w_{ij}^f, X_i, y_i]$$

(3)

The budget constraint is adjusted accordingly for singles (see Myck 2016 for details). To capture heterogeneity in preferences between different types of families, parameters  $\beta_1$  and  $\beta_3$  of the utility function are interacted with individual and family characteristics. The estimation is done using the conditional logit model. While this relies on a number of assumptions, earlier studies have shown that relaxing them in static models – for example through accounting for unobserved heterogeneity – changes little as far as the resulting elasticities and model predictions are concerned (e.g. Haan 2006, Myck 2014).<sup>6</sup>

**RESULTS: SIMULATING THE LABOR SUPPLY RESPONSE TO THE FAMILY 500+ REFORM**

The parameters of utility functions estimated using the approach described above may serve on the one hand to identify labor supply elasticities (see Myck 2014 and 2016), and on the other to simulate labor market reactions to changes in the budget constraint, which may result from changes in earnings and from reforms to the tax and benefit function.

In Table A1 in the Appendix, we present details of the estimated net income elasticities (see Myck 2014 and 2016). The most notable point with regard to the stability of the estimated parameters is the reduction in labor supply elasticity among women in couples between 2013 and 2015. For example, own net income elasticity among women in “two flexible” couples falls from 0.70 in 2013 to 0.61 and 0.65 in the two following

<sup>6</sup> The sample sizes for the estimation on the 2015 data are: 3,004 for single women, 13,456 for women in couples using Model A approach, and 13,755 using Model B approach.

Table 2

**Effects of the Initial and the Expanded Family 500+ Program on Female Labor Supply**

	Initial 500+		Expanded 500+	
Single women:	-24,500 (2,052.0)		-3,000 (741.1)	
Women in couples:	Model A	Model B	Model A	Model B
	-133,100 (7,344.8)	-179,000 (7,359.4)	18,000 (4,683.9)	-17,800 (3,318.5)
Total:	-157,600	-203,500	15,000	-20,800

Notes: Simulated averages rounded to nearest hundred. In couples with two labor supply flexible partners, Model A allows labor market adjustment of both partners in couple while Model B keeps male labor supply fixed: in such a case, all women in couples are modeled as if they were in one person flexible couples; standard errors calculated using the parametric bootstrap given in parentheses.

Source: Authors' calculations based on 2015 PHBS data using population adjusted grossing-up weights (Myck and Najsztub 2015).

years respectively. Among women in “one flexible” couples, total net income elasticity stood at 0.64 and fell to 0.50 and 0.58 in the following years in the Model A specification; it stood at 0.67 and fell to 0.54 and 0.58 in the Model B specification. Labor supply elasticities among men in couples are consistently very low, while among singles range between 0.06 and 0.11, significantly lower compared to single women (0.23–0.29). As a consequence of the low values of labor supply elasticities, the resulting labor market response to the benefit reform among men is negligible. In the presentation of the results, we thus focus only on the labor supply of women.

The estimated labor supply effects resulting from the introduction of the Family 500+ program are calculated on the basis of the simulated labor market choices under the baseline and the reformed tax and benefit systems. Simulation results isolate the effects of the two versions of the Family 500+ program: the one initially introduced in April 2016 (“Initial 500+”), and the program’s expansion to a fully universal system as of July 2019 (“Expanded 500+”). Both versions of the program are simulated *as if* they came into effect in 2016, i.e. are modeled on the preferences estimated prior to the implementation of the initial version of the reform.

Using the latest pre-reform estimates, based on 2015 PHBS data, the simulated effect of the Family 500+ program as implemented in 2016 is a reduction of female employment of between approx.160,000 and 200,000, based on Models A and B respectively. Of this total labor market response, 24,500 are lone mothers. Approximately 50 percent of the simulated labor supply reduction are mothers of only one child and only about 10 percent falls on mothers with three or more children. As is evident from the simulation of the expanded, fully universal 500+ program, which does away with the means testing of the benefit for the first child, the negative labor supply effects almost entirely disappear in the Model B specification, and in Model A the simulated response is positive. In both cases, the absolute numbers are low given the scale of the universal 500+ design. Under the Model B specification, the simulation suggests a reduction in the labor supply of about 20,000 women, while under the Model A specification, it suggests an increase in the labor supply of about 15,000.

In either case, it is important to note that we simulate the fully universal Family 500+ reform *as if* it were implemented at the time when the initial design of the reform came in, i.e. in early 2016. In reality, it was only proposed by the government three years later and came into effect in July 2019. As demonstrated by Magda et al. (2018), some of the withdrawal from the labor market resulting from the changed incentives after April 2016 had already happened before the universal benefit was introduced and it might take some time for the labor market to return to higher employment levels following the introduction of the fully universal design of the program in July 2019. In Table A2 in the Appendix, we show the simulated response based on earlier data – from 2013 and 2014. The differences compared to the simulations based on 2015 data are broadly consistent with the estimated changes in labor supply elasticities. Simulations based on the earlier years of data suggest the total negative effect of between 180,000 and 210,000 following the initial 500+ reform and between minus 19,000 and plus 10,000 in response to the universal design.

## CONCLUSION

Since April 2016, Polish families with children have been receiving universal support of PLN 500 for each second and subsequent child aged 0–17 years and on top of that an additional PLN 500 per month for the first child in this age range if monthly family income fell below the threshold of PLN 800 per person (or PLN 1,200 in the case of child disability). The Family 500+ program, with an annual cost of about PLN 22 billion (1.1 percent of GDP), has had a substantial effect on the material situation of about 2.7 million families with children, which represent nearly two thirds of the families with children in this age group. It has contributed to significant reductions in the level of child poverty and may have increased fertility, although the latter is difficult to identify and increases in the number of births since 2016 have been modest. In July 2019, the government further extended the program and made it fully universal for all children in the 0–17 age group, adding further a PLN 18.3 billion to its annual cost, which implies that the total cost of the program will amount

to nearly 2 percent of GDP. As demonstrated in Myck et al. (2019), the extension will largely benefit middle- and high-income families, with nearly one third of the extra cost channeled through to families in the top quintile of the income distribution.

In this paper, using the Polish Household Budget Survey for 2015, i.e. the latest year prior to the introduction of the program, we updated earlier results of Myck (2016) and showed that the overall equilibrium labor supply effect of the rollout of the partially universal Family 500+ in 2016 could be expected to result in a withdrawal of between 160,000 and 200,000 women from the labor market. A simple comparison of employment dynamics among women with and without children between 2011 and 2017 suggests divergence in female employment trends after 2015, which is in line with the simulation, and the results are broadly consistent with a short-term ex-post analysis of Magda et al. (2018). It is worth noting, though, that our analysis is a clear *ceteris paribus* simulation and singles out only the financial aspect of the reform. Thus, it does not account for other factors that may have been a consequence of the reform, such as changes in wages or work conditions to limit the outflow of female employees. Similarly, we also cannot account for labor market adjustments aimed at ensuring that family income is just below the means-test threshold. There has been some anecdotal evidence for both of these phenomena, and they would both limit the negative employment consequences of the reform. Additionally, recent increases in wages, fueled by rapid economic development and significant growth in the minimum wage after 2015, reduced the value of the 500+ benefits relative to in-work income, and may have also limited its negative labor market effects.

Our labor supply simulations also covered the fully universal design of the Family 500+ program as if it were implemented instead of the initial design in April 2016. The results suggest that doing away with the means test for the 500+ benefits for the first child in the family either almost entirely limits the negative labor supply consequences of the program, or even leads to a positive labor supply response. The simulated range of the labor supply reaction to this fully universal 500+ design ranges between minus 21,000 and plus 15,000. This on the one hand demonstrates a major role that the means test has played in determining the labor supply reaction, and on the other suggests that the program's negative effects on the employment of women may disappear over time. Whether and how quickly this happens will depend on the degree of state dependence on the Polish labor market and the ease with which women who dropped out of employment will be able to return to work. Such returns would certainly be facilitated by the favorable conditions on the Polish labor market should they continue in the coming months.

The medium- and long-run benefits of the Family 500+ program will need to be judged on their merits and set against the cost of the policy. As we have shown

in this paper, broadly speaking the fully universal design has advantages in terms of its neutral implications for female employment, although there is no doubt that with this amount of resources the benefit could be designed in a way that would encourage much higher participation among women (see, e.g. Bargain and Orsini 2006, Immervoll et al. 2007, Brewer et al. 2010, Figari 2015, Kurowska et al. 2017). At the same time, only 14.2 percent of the PLN 40 billion (about EUR 9.4 billion), which is the total annual cost of the fully universal scheme, will be distributed to families in the bottom quintile of the distribution. While the initial, partially means-tested design has already been criticized for its poor benefit targeting on low income households (Brzeziński and Najsztub 2017), the performance of the universal scheme will by design be worse. The third dimension of the program, perhaps the crucial one given the background of record low fertility rates, is its consequences for parents' decisions with regard to family size. Poland's fertility rate following the introduction of the program has slightly increased (from 1.29 in 2015 to 1.44 in 2018), although given the scale of the reform its growth has been rather disappointing. Whether families decide to have more children in response to the fully universal design of the program is unclear, since its extension will largely benefit those on middle and high incomes for whom financial constraints are less likely to stop or delay procreation decisions.

Distributional and labor supply analysis of the Family 500+ program suggest therefore that at a cost of 2 percent of GDP it is not a very efficient mechanism for reducing poverty and in its latest format it is neutral with regard to female employment. It also seems unlikely on its own to significantly increase the fertility rate. Higher family incomes may, of course, result in improved long-term outcomes for today's children (Carneiro et al. 2015), but here again the question is if the same effects could not be achieved with better targeting. Combined with other family benefits and child tax credits, the total value of financial support for families with children is now around 4 percent of GDP, which is one of the highest levels in the European Union. Given the complex set of objectives that such support aims to achieve and the structure of the tax and benefit system following the introduction and the extension of the Family 500+ program, it seems that a comprehensive approach to the redesign of the full set of policies for families with children might be needed to effectively reduce poverty, encourage a higher level of female labor market activity, and provide conditions for higher rates of fertility.

## REFERENCES

- Aaberge, R., J. Dagsvik, and S. Strom (1995), "Labor Supply Responses and Welfare Effects of Tax Reforms", 197 (4), 635–59.
- Bargain, O. and K. Orsini (2006), "In-Work Policies in Europe: Killing Two Birds with One Stone", *Labour Economics* 13 (6), 667–693.
- Bargain, O., K. Orsini, and A. Peichl (2014), "Comparing Labor Supply Elasticities in Europe and the US: New Results", *Journal of Human Resources* 49 (3), 723–838.
- Blundell, R., A. Duncan, J. McCrae, and C. Meghir (2000), "The Labour Market Impact of the Working Families' Tax Credit", *Fiscal Studies* 21, 75–103.
- Brewer, M., A. Duncan, A. Shephard, and M. J. Suarez (2006), "Did Working Families' Tax Credit Work? The Impact of In-Work Support on Labour Supply in Great Britain", *Labour Economics* 13 (3), 699–720.
- Brewer, M., E. Saez, and A. Shepard (2010), "Means-Testing and Tax Rate on Earnings", in J. Mirrlees (Chair), *Dimensions of Tax Design: The Mirrlees Review*, Oxford: Oxford University Press.
- Brzeziński, M. and M. Najsztub (2017), "The Impact of Family 500+ Programme on Household Incomes, Poverty, and Inequality", *Polityka Społeczna*, 1 ENG/2017.
- Callan, T., A. van Soest, and J. Walsh (2009), "Tax Structure and Female Labor Supply: Evidence from Ireland", *Labour* 23 (1), 1–35.
- Carneiro, P., K. V. Loken, and K. G. Salvanes (2015), "A Flying Start? Maternity Leave Benefits and Long-Run Outcomes of Children", *Journal of Political Economy* 123 (2), 365–412.
- Eissa, N. and J. Liebman (1996), "Labor Supply Response to the Earned Income Tax Credit", *Quarterly Journal of Economics* 111 (2), 605–37.
- Figari, F. (2015), "From Housewives to Independent Earners: How the Tax System Can Help Women to Work in a Context of Strong Familialism", *Journal of Social Policy* 44 (1), 63–82.
- Francesconi, M., H. Rainer, and W. van der Klaauw (2009), "The Effects of In-Work Benefit Reform in Britain on Couples: Theory and Evidence", *Economic Journal* 119 (535), 66–100.
- Francesconi, M. and W. van der Klaauw (2007), "The Socioeconomic Consequences of In-Work Benefit Reform for British Lone Mothers", *Journal of Human Resources* 42 (1), 1–31.
- Geyer, J., P. Haan, and K. Wrohlich (2015), "The Effects of Family Policy on Maternal Labor Supply: Combining Evidence from a Structural Model and a Quasi-Experimental Approach", *Labour Economics* 36, 84–98.
- Goraus, K. and G. Inchauste (2016), "The Distributional Impact of Taxes and Transfers in Poland", *Policy Research Working Paper* no. 7787, World Bank.
- GUS (2019), "Statistical Bulletin 05/2019", Główny Urząd Statystyczny – Polish Central Statistical Office, Warsaw.
- GUS (2018), "Urodzenia i Dzietność", Główny Urząd Statystyczny – Polish Central Statistical Office, Warsaw.
- GUS (2017), "Zasięg ubóstwa ekonomicznego w Polsce w 2017 r.", Główny Urząd Statystyczny – Polish Central Statistical Office, Warsaw.
- Haan, P. (2006), "Much Ado about Nothing: Conditional Logit vs. Random Coefficient Models for Estimating Labour Supply Elasticities", *Applied Economics Letters* 13 (4), 251–56.
- Haan, P. and M. Myck (2007), "Apply with Caution: Introducing UK-Type In-Work Support in Germany", *Fiscal Studies* 28, 43–72.
- Haan, P. and M. Myck (2012), "Multi-Family Households in a Labour Supply Model: A Calibration Method with Application to Poland", *Applied Economics* 22, 2907–19.
- Haan, P. and K. Wrohlich (2011), "Can Child Care Policy Encourage Employment and Fertility?: Evidence from a Structural Model", *Labour Economics* 18 (4), 498–512.
- Immervoll, H., K. J., Kleven, C. T. Kreiner, and E. Saez (2007), "Welfare Reform in European Countries: A Microsimulation Analysis", *The Economic Journal* 117 (516), 1–44.
- Kurowska, A., M. Myck, and K. Wrohlich (2017), "Making Work Pay: Increasing Labour Supply of Secondary Earners in Low Income Families with Children in Poland", *Contemporary Economics* 11 (2), 161–70.
- Magda, I., A. Kiełczewska, and N. Brandt (2018), "The Effects of Large Universal Child Benefits on Female Labour Supply", IZA Discussion Paper No. 11652, IZA-Bonn.
- Mastrogiacomo, M., N. M. Bosch, M. D. Gielen, and E. L. Jongen (2017), "Heterogeneity in Labour Supply Responses: Evidence from a Major Tax Reform", *Oxford Bulletin of Economics and Statistics* 79 (5), 769–96.
- Myck, M. (2014), "Stability of Elasticity Estimates in the Context of Significant Changes in Labour Market Incentives", *CenEA Working Paper* no. 1/2014.
- Myck, M. (2016), "Estimating Labour Supply Response to the Introduction of the Family 500+ Programme", *CenEA Working Paper* no. 1/2016.
- Myck, M., M. Kundera, M. Najsztub, and M. Oczkowska (2015), "Portfele gospodarstw domowych po expose premier Beaty Szydło", *CenEA Elections Commentary* 19/11/15.
- Myck, M., M. Kundera, M. Najsztub, and M. Oczkowska (2016), "25 miliardów złotych dla rodzin z dziećmi: projekt Rodzina 500+ i możliwości modyfikacji systemu wsparcia", *CenEA Elections Commentary* 18/01/2016.
- Myck, M. and M. Najsztub (2015), "Data and Model Cross-validation to Improve Accuracy of Microsimulation Results: Estimates for the Polish Household Budget Survey", *International Journal of Microsimulation* 8 (1), 33–66.
- Myck, M., M. Najsztub, M. Oczkowska, and K. Trzcinski (2019), "Pakiet podatkowo-świadczeniowych rozwiązań rządu Zjednoczonej Prawicy", *CenEA Elections Commentary* 06/05/2019.
- Premik, F. (2019), "Child Support Instruments and Labour Supply: Evidence from a Large Scale Child Benefit Programme", presentation at the National Bank of Poland Summer Workshop.
- van Soest, A. (1995), "Structural Models of Family Labor Supply: A Discrete Choice Approach", *Journal of Human Resources* 30, 63–88.
- van Soest, A., M. Das, and X. Gong (2002), "A Structural Labour Supply Model with Flexible Preferences", *Journal of econometrics* 107 (1-2), 345–74.

## APPENDIX:

Table A1

## Net Income Elasticities Derived on the Basis of the Estimated Labor Supply Models for the Years 2013, 2014, and 2015

Model A: two flexible couples		Own net income elasticity		Cross net income elasticity	
Men:	2013	0.032	(0.006)	-0.002	(0.005)
	2014	0.029	(0.004)	-0.001	(0.001)
	2015	0.033	(0.004)	-0.003	(0.001)
Women:	2013	0.700	(0.028)	-0.040	(0.008)
	2014	0.614	(0.028)	-0.021	(0.005)
	2015	0.645	(0.027)	-0.014	(0.010)
<b>Total net income elasticities:</b>					
Model A: one flexible couple:		Men		Women	
	2013	0.039	(0.012)	0.636	(0.052)
	2014	0.039	(0.011)	0.498	(0.051)
	2015	0.027	(0.011)	0.577	(0.059)
Model B: one flexible couple:		Men		Women	
	2013	0.040	(0.011)	0.665	(0.023)
	2014	0.039	(0.010)	0.539	(0.022)
	2015	0.030	(0.011)	0.581	(0.023)
Singles:		Men		Women	
	2013	0.111	(0.018)	0.232	(0.024)
	2014	0.069	(0.014)	0.290	(0.022)
	2015	0.062	(0.012)	0.278	(0.020)

Notes: In couples with two labor supply flexible partners, Model A allows labor market adjustment of both partners in couple while Model B keeps male labor supply fixed; in such a case, all women in couples are modeled as if they were in one person flexible couples; standard errors, calculated using the parametric bootstrap, given in parentheses.

Source: Authors' calculations based on 2013, 2014, and 2015 PHBS data using population adjusted grossing-up weights (Myck and Najsztub 2015).

Table A2

## Labor Supply Effects of the Initial and the Expanded 500+ Program: Based on 2013 and 2014 Data

	Initial 500+		Expanded 500+	
<b>2013:</b>				
Single women:		-23,600 (2,818.0)		-3,500 (1,005.1)
Women in couples:	Model A	Model B	Model A	Model B
	-189,800 (8,164.8)	-189,000 (9,102.1)	-2,600 (3,325.9)	-3,000 (1,367.6)
Total:	-213,400	-212,600	-6,100	-6,500
<b>2014:</b>				
Single women:		-30,000 (2,531.3)		-6,000 (1,036.2)
Women in couples:	Model A	Model B	Model A	Model B
	-147,000 (8,238.5)	-168,100 (8,063.3)	15,400 (3,167.7)	-13,000 (3,316.7)
Total:	-177,000	-198,100	9,400	-19,000

Notes: Model A allows labor market adjustment of both partners in couple; Model B keeps male labor supply fixed; standard errors, calculated using the parametric bootstrap, given in parentheses.

Source: Authors' calculations based on 2013 and 2014 PHBS data using population adjusted grossing-up weights (Myck and Najsztub 2015).